

TIMES EVOKE

THE AUDACITY OF HOPE

Think of 'the news' today and here's what comes to mind — trade wars. Real wars. Murders. Abuse. Violations. Evasions. Circles of cynicism. Pits of danger. Every place you look, politics seems a swamp and civil society, a battlefield. You could be forgiven, gentle reader, for thinking the world is a sickening place and there's little to be optimistic about while we blow up our own face.

Yet, do not despair — there are those of great heart among us yet. We refer to conservationists, scientists, animal carers and plant whisperers, who strive to protect non-human species many of us are determined, in jaded awareness and foolish ignorance, to destroy. Interestingly, the more the Anthropocene — the era of human impacts reshaping Earth — extends, the greater such efforts grow. The protection of wildlife has its roots in the 19th century recognition of how industrialisation was damaging societies. Clearing through forests, mountains and rivers, rampant commerce, wielding the axe of technology, was destroying ecology — and non-human lives. Shocked by vanishing species — once, millions of American bison roamed the Great Plains but only 100 were left by 1900, which is 100 more than the Great Auk, mercilessly slaughtered to extinction for oil in Iceland — humane beings decided to save what was left. Conservation groups grew in the late 19th-early 20th centuries, determined to stop hunting, punish poaching, end animal ivory and fur trades, reserve tracts of land and sea for non-human beings and prevent pollutants poisoning these. We now see captive breeding programs, protecting vulnerable birds, animals, plants and fungi, reintroducing species into the wild, restoring habitat and making visionary changes, like carving new ship routes in seas to save whales or creating tree hollows for birds, bats and marsupials.

In these efforts also glimmers an endeavour to save humanity. Some of us recognise there is more to life on Earth than a shiny phone or a 'viral' dish — we humans share a deeper existential link with other inhabitants of this world. Why are we all here? Why did each species evolve as it did — and how does every living thing have its own unique nature? Where do we all go from here — and how should we live together? Some of us still dare to think — with love and understanding. We honour such efforts in Times Evoke. As TE's global experts outline, we have volumes to learn from other species, from wisdom and joy in a dog's mind to operas of experience in a seal's call. The more we respect non-human beings, the more beautiful our life becomes for we rediscover purity. Join Times Evoke as we celebrate conservationists with the audacity of hope — they give us great news.

'The chytrid fungus devastated amphibians globally — frog spas and saunas can help'

Simon Clulow is Associate Professor in Conservation Ecology at the University of Canberra, Australia. Speaking with Srijana Mitra Das at Times Evoke, he discusses saving a very special frog:

What is the core of your research?

My research tries to tackle global environmental challenges. I've worked particularly on invasive species and I've been involved for two decades now on emerging diseases, especially the chytrid fungus which has swept the world, wreaking havoc on amphibian biodiversity. Many global problems are difficult to eradicate, so a lot of my work focuses on how we can mitigate impacts, so native species can survive.

Over 40 frog species in Australia have declined heavily due to the disease linked to the chytrid fungus. Seven went extinct completely. This is a worldwide problem but the story starts in Australia because it was only due to the disappearance of the unique gastric brooding frog that triggered people to realise there was a global problem of declining frog species. The cause was chytrid fungus, this microscopic invasive fungal pathogen that lives in water and infects frogs. This emerged in the 1970s, swept the world and sent 100 species completely extinct, with another 400 facing huge population declines.

Can you tell us about the green and golden bell frogs you're working on now?

The green and golden bell frog used to be one of the most common species on the eastern seaboard of Australia — it's now disappeared from over 90% of its range, occurring only in a very small number of scattered locations along the East Coast. It's disappeared entirely in the Australian Capital Territory (ACT) region, which is inland and has a slightly higher elevation. Now, some frogs managed to just hang on in lowland areas towards the coast, where the climate is milder, temperatures slightly warmer through winter and wetlands have more saline influences. I've spent 15 years researching this species and found that slightly elevated water salinity can be detrimental to the fungal pathogen while the frogs do fine — wet, cold conditions favour the pathogen. At 25 degrees, it starts to get suboptimal for the fungus — above 27 degrees can be lethal.

Now, our research showed the green and golden bell frog prefers to be in 28 to 30 degrees. Those observations have led us to the approaches we trialed in my lab and in mesocosms at the university — we've shown that if you can create small pockets of habitat with these environmental stressors or conditions, like temperature and salinity, the pathogen is harmed. These environmental stressors give frogs the upper hand potentially over the infection — rather than mass perishing, frogs might get sick but they're able to clear themselves of the infection. Alongside, those conditions could make the pathogen less able to infect hosts.

We call these 'disease refugia' — we've been developing simple, low-tech, affordable and scalable ways to manipulate the environment to hopefully return the green and golden bell frog. After 50 years of it being extinct in the ACT, we've released it at 15 wetlands, creating small pockets of disease refugia.

Can you tell us about your frog spas and saunas? Our strategy is multi-pronged and the frog spas and saunas are an important part. Too much stress is bad for any organism and we thought we'd flip that paradigm — the fungal pathogen is also a multicellular organism. So, if we could deliberately create additional stress for it, we could tip the balance — slightly elevated salinity and temperatures above a certain threshold do exactly that. Our little saunas are literally just piles of house bricks that the frogs love to get into because they provide nice refuges and have little holes and cracks in them, so frogs feel snug and safe there. If you paint these black and put little greenhouses over them, they heat up well in the sun, even when it's very cold — in winter here, when the temperature can be close to 0 degrees, these can heat up to 25 degrees or more. Those conditions favour frogs over the pathogen.

For the saline influence, we didn't want to go and tip truckloads of salt into giant wetlands — so, we developed small satellite ponds, digging in cattle



SAFETY WEBS: The green and golden bell frog was once abundant across Australia till the chytrid fungus hit — scientists are now trying to rewild the 8.5 cm frog, related to the 55-million-year-old tree frog family

troughs which are cheap and easy. They're little ponds around big wetlands and we can manipulate the salinity there easily without affecting anything else. The frogs love to use them — and they get a healthy dose of that slightly elevated salinity which the pathogen hates.

Another prong is a human health approach — we and other researchers developed a way to immunise some frogs against the disease. That's enabled us to release a few hundred such frogs into the wild. They should be protected, at least for that generation, so hopefully, they live long and breed — the offspring, of course, are not immunised but they're hopefully afforded protection by our spas and saunas. So, we aim to create this roll-away effect of basically self-immunising over generations.

How will you monitor the frogs you've released?

We've actually tagged them with a little microchip just under their skin. We go out at night now and

WITNESSING OUR EARTH: Frogs are 250-million-years old

Skeptics will ask, why should humans even worry about the fate of frogs? Humans couldn't survive without frogs — it's that simple. Frogs are an incredibly important part of our ecosystems. They eat huge numbers of invertebrates and control insect populations, which would otherwise cause plagues and diseases like malaria. We'd be overrun with insects without frogs. Tadpoles are one of the most important aquatic nutrient cyclers — wetlands, streams and waterways would not function without them. Frogs are also a crucial source of medical tech and innovation.

Also, frogs are just incredible animals, as amazing as whales, pandas or mammals we are perhaps more drawn to. Frogs are very beautiful, extremely interesting and incredibly diverse. We have two species in Australia called hip pocket frogs — the males have little pouches, a bit like a kangaroo's pocket, on their hips. The female lays eggs on a forest floor and the male comes up just when they're ready to hatch. The tadpoles hatch and wriggle inside his pockets. Now, he's the size of your thumb nail and he has those tadpoles living entirely in his pockets where they metamorphose into froglets, coming out about the size of a match head — then, they're off on their own journeys into the rainforests of southeast Australia.

Frogs have seen millions of years of evolution that other animals haven't achieved — they are vital to the existence of the world as we know it.



REJUVENATE: Clulow and team created frog spas and saunas with higher temperatures and salinity

FROG WORLDS

At 11 feet and 2,500 pounds, steller sea lions are the largest members of the Otariidae or 'eared seal' family — they live in the subarctic North Pacific. Their populations began shrinking in the 20th century, due to intentional culling by fishermen who found them 'competitors' for fish and unintended killing by fisheries. Conservationists sought intentional culling to be banned and no-go zones for fishing — hence, steller sea lions are now 'near threatened' as opposed to 'nearly extinct'

The Iberian lynx was once abundant in Spain and Portugal — with habitat loss, reduced rabbit prey and poaching of the striking tuft-eared wild cat, the lynx became endangered by 1986 — by 2005, conservationists found no lynxes in Portugal. With efforts to strengthen their dietary sources and breeding centres started in the Algarve, captive lynxes were slowly released into the wild, the species gradually rebounding to 'vulnerable'

Peregrine falcons are the world's fastest animal — they can dive-bomb prey at 320 knts an hour. On coasts, deserts and peaks worldwide, they became endangered in the 1970s — pesticides, particularly DDT, were poisoning their diet and eggs. Peregrines crashed by 90%. The US banned DDT while scientists started captive breeding — chicks hatched in labs were protected until they could fly. Today, the falcon enjoys its Latin name 'peregrin' — 'traveller' — happily roaming the world



KEEP THE FAITH...

'Dogs can learn the names of hundreds of toys — their language develops by eavesdropping on us'

Shany Dror is a cognitive researcher at the Veterinary University of Vienna. Speaking with Srijana Mitra Das in TE, she explains the importance of gifted dogs whose cognition can match a human toddler:

So, you think you're smart? Try to understand important words said in an entirely unknown language, used by a totally different species — now, multiply that by several languages. Even as we dazed humans reach for our AI assistants — who will also have a tough time trying to translate the talk of whales or parrots to us — non-human beings might just have an edge here.

Scientists have found gifted dogs can learn entire 'label' words in human languages, often simply by 'eavesdropping' on people, as Shany Dror, cognitive researcher, tells TE. Sitting beside delicate pink orchids in gleaming brass pots, Dror says, 'Humans are always interested in what makes us 'human' — why are we so different from other animals? In the past, people thought only humans could use tools but research by Jane Goodall showed how other species also make and deploy tools. Now, several researchers feel what makes us human is our ability to use language. In nature, we see several intricate communication systems — but none is as complex as human language. We need to understand which experiences have shaped our language — and that is where dogs come into the picture because unlike other animals used earlier to study language, like dolphins or parrots, dogs were raised in our environment. Today, in fact, pet puppies are often exposed to an atmosphere very similar to a developing child.' As with children, that's where toys come



SMART GIRL! Mugsy is a seven-year-old female Miniature Australian Shepherd who knows and loves her many toys — if your dog is as gifted, contact: geniusdogchallenge.com

in. Initially, Dror found dogs who understood the word 'ball' — then, she found some who understood the difference between 'ball', 'frisbee' and 'rope'. She says, 'Most dogs easily learn 'sit' or 'stay', which are labels for actions — but certain dogs can learn the labels of objects. Those are exceptional in their ability — they can learn a new label after hearing it just four times. We found even if you gave these dogs 12 new toys with distinct names every week, they could learn the individual names very fast and remember them for years.'

It's not due to training — some of that just depends on your dog hanging out with you. Dror says, 'Through my research, I noticed dogs pay a lot of attention to what their owners are saying and doing — owners recounted several indicative stories. Once, one was pondering aloud over ordering a pizza — their dog came straight into

the living room, holding up its toy named 'Pizza'. Another was talking about a bag on the phone and her dog, who has a toy called 'Bag', immediately brought it to her. This deepened my curiosity about how closely dogs watch and hear their owners and interpret their world.'

Among experiments, Dror set up two pet owners sitting down and chatting about toys, all of which had names. Their dog would be sitting in the background, listening — each time the owners mentioned a certain toy amongst themselves, the dog, without being asked to, brought it along. Dror emphasises, 'This ability is very rare among dogs — but it exists.' She calls this kind of canine 'genius dog' — she says, 'We've found these gifted dogs don't just learn the names or labels of two or three objects, they learn hundreds. Much depends on how many toys their owners

buy them — some people told me initially, 'Oh, my dog knows just a few toy names'. As the dog became a much-doted-on pet, within two years, it had learnt the names of 200 different toys bought for it.'

In India, where many households speak multiple languages, this presents fascinating possibilities. Is it likely that an Indian pet might recognise multilingual words? Dror muses and replied, 'In many senses, when dogs are learning the name of an object, they don't have the context of a linguistic distinction, as in understanding — this is one language, that is another language. In our studies, we have pet owners from different parts of the world who normally speak, say, Portuguese, English and Spanish with their dog. When it comes to specific names of toys, the dogs don't care. But studies conducted by other researchers show dogs do have a sensitivity in fMRI scans — they show a different reaction to their language as opposed to a different language. When a dog is exposed daily to multiple languages spoken in the same household, I'd say the dog doesn't distinguish because for it, this is just part of their daily life.'

So, is it then fair to assume that memory, application and intelligence, our species' much-vaunted gifts, are not only human — and are widely found in other species? Dror replies, 'The term 'intelligence' includes different things. When we talk about animals, usually we don't talk about general intelligence but specific things, like social cognitive abilities. Dogs are extremely good at this, being very perceptive at understanding social communication. They are not as good at, say, spatial intelligence or navigating in space — many of us know that moment when your dog is carrying a stick around in its mouth and gets stuck in a door and can't pass. In contrast, elephants and parrots have very good spatial intelligence.' Dror emphasises, 'It's important to note every animal has its own specialisation — humans are terrible at echolocation. A bat would be like, 'Oh my God, they're so stupid at that!' Intelligence is both natural and highly specific.'

Skeptics — and there are always some,

with inordinate time on their hands — would ask, what is the point even of trying to understand animal cognition? Dror replies, 'Domesticated dogs developed in the same environment that we did. They were exposed to the same pressures. If we can understand some of the similarities in how we and they see the world, that would tell us a lot about which environmental factors, as opposed to our genetic background, shaped us. Humans and dogs are very different genetically but grew up in the same environment — so, in many senses, they're putting a mirror in front of us. We have a lot to learn from them.'

TE can't resist asking, 'Are dogs better at understanding humans than the other way around?' Dror smiles, possibly the very tender smile of a pet owner whose life has been changed by a dog. 'That's a good question... in our experiments, we put the toys referred to in another room but the dog would go get them from there when mentioned. Dogs are exceptional at reading the smallest cues humans give. Think of how before you know you're going to get up, your dog is already stretching or you think you'll go for a walk and your dog is already ready. They are extremely observant — and they definitely read us way better.'

VP Singh, Noida



LOOK AT CLEVER ME! Harvey, a Border Collie

READERS WRITE

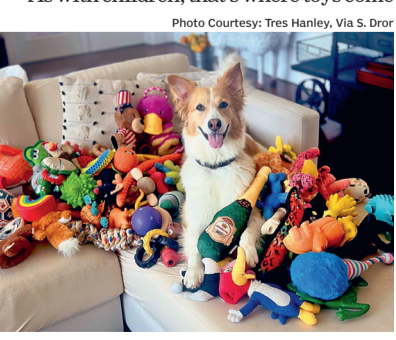
Dear Times Evoke, I am a regular TE reader and love all TE topics. For me, 'TE' is the truth — 'Totally Eternal'. My entire family simply loves this page. My kids owe so much knowledge to TE. The Iran page (18th January, 2026) was truly eye-opening. I particularly loved the editorial titled 'The Iran-Y of it All'. By focusing on its environmental breakdown, TE actually enlightened us about Iran's core problems. Thanks, TOI! — Dr Anuj Kumar Singh, Varanasi

Thank you, TE, for the excellent articles on how Iran has both energy-driven development with severe air pollution and water stress. Both global experts, James Gustafson and Ciruce Mohaveidi-Lankarani, explained Iran's journey from its Nadir Shah era to its current protests in such a lucid manner. Looking forward to many more such wonderful pages! — Priyanka Samanta, Hyderabad

I really appreciated TE's beautiful page on Iran. TE always covers the most crucial and unusual aspects of pressing issues. The inappropriate use of natural resources always leads to unacceptable inequality — this, in a nutshell, is what ails Iran today. Keep on enriching our knowledge, dear TE! — VP Singh, Noida

It was amazing to learn about Iran's ecology! TE's extremely informative articles shed so much light on utterly unknown sides to Iran. Atomicity and industrialisation are just the tip of the iceberg in a country with such extraordinary energy history. True 'Iran-y', as TE's edit put it. Thank you, Times Evoke, for always bringing us such thought-provoking articles. — Rashi Beriwal, Gurugram

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LOVE: Shira, a rescue, knows 300 toy names